24
CLAIMS

1.   A method for recovering data transmitted on a physical channel,
2   wherein a channelization code used for the physical channel is not known at
the time of the data recovery, the method comprising:
4   receiving and processing a modulated signal to provide received
samples;
6   selecting a hypothesized channelization code for processing the physical
channel;
8   processing the received samples with the hypothesized channelization
code to generate partially processed symbols;
10   storing intermediate results representative of the partially processed
symbols;
12   determining an actual channelization code used for the physical channel;
and
14   processing the intermediate results in accordance with the actual
channelization code and the hypothesized channelization code to provide final
16   results.

2. The method of claim 1, further comprising:
2   selectively combining the final results from multiple symbol periods to
obtain a recovered symbol, wherein each symbol period corresponds to
4   duration of the actual channelization code.

3.   The method of claim 2, wherein the selectively combining is
2   performed in a manner complementary to an encoding performed in
accordance with a space time block coding transmit antenna diversity (STTD)
4   mode defined by W-CDMA standard.

4. The method of claim 1, wherein the processing the received samples
2   includes
decovering the received samples with the hypothesized channelization
4   code to generate decovered symbols, and
demodulating the decovered symbols with pilot estimates to generate
6   the partially processed symbols.

5. The method of claim 4, wherein the demodulating with the pilot
2   estimates includes

performing a dot product between the decovered symbols and the pilot

4   estimates, and

performing a cross product between the decovered symbols and the

6   pilot estimates, and

wherein the partially processed symbols are derived based on results of

8   the dot and cross products.

6. The method of claim 1, further comprising:

2   combining partially processed symbols from a plurality of demodulation

elements assigned to process the physical channel to generate the intermediate

4   results.

7. The method of claim 1, wherein the processing the intermediate

2   results includes

partitioning the intermediate results into sets of intermediate results,

4   scaling each intermediate result in a particular set with a respective

scaling factor determined by the actual channelization code and the

6   hypothesized channelization code, and

combining the scaled results for each set to obtain a final result for the

8   set.

8. The method of claim 7, wherein the scaling factor is either +1 or -1.

9. The method of claim 1, wherein the hypothesized channelization code

2   is a member of a set of channelization codes that may be used to generate the

actual channelization code, and wherein the hypothesized channelization code

4   has a length that is shorter or equal to that of the actual channelization code.

10. The method of claim 9, wherein the hypothesized channelization

2   code can be used to generate all channelization codes in the set.

11. The method of claim 9, wherein the hypothesized channelization

2   code is an orthogonal variable spreading factor (OVSF) code.

12. The method of claim 11, wherein the hypothesized OVSF code has a

2   largest spreading factor among the channelization codes in the set.

13. The method of claim 11, wherein the hypothesized OVSF code has a
2 spreading factor of four or greater.

14. The method of claim 11, wherein the hypothesized OVSF code and
2 the actual OVSF code each has a spreading factor ranging from four to 512.

15. The method of claim 4, wherein the pilot estimates are generated by
2 despreading the received samples with a pilot despreading code, and
integrating the despread pilot samples over a length of the pilot
4 despreading code to obtain the pilot symbols that are then used to generate the
pilot estimates.

16. The method of claim 15, wherein the pilot estimates are generated by
2 interpolating or extrapolating the pilot symbols.

17. The method of claim 1, wherein the physical channel has a variable
2 data rate.

18. A method for recovering data transmitted on a physical channel,
2 wherein at least one characteristic of the data transmission is not known at the
time of the data recovering, the method comprising:
4 receiving and processing a modulated signal to provide received
samples;
6 determining a hypothesized parameter value corresponding to an
unknown characteristic of the data transmission;
8 processing the received samples with the hypothesized parameter value
to generate intermediate results;
10 storing the intermediate results;
determining an actual parameter value for the unknown characteristic;
12 and
further processing the intermediate results using the actual parameter
14 value and the hypothesized parameter value to provide final results.

19. The method of claim 18, wherein the hypothesized parameter value
2 corresponds to a channelization code used to channelize the data.

20. A receiver unit operative to process a physical channel in a CDMA
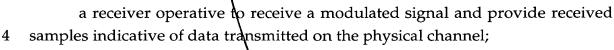2 communications system, comprising:

a receiver operative to receive a modulated signal and provide received
4   samples indicative of data transmitted on the physical channel;

      at least one demodulator element coupled to the receiver, each
6   demodulator element including

        a data processing unit operative to receive and process the
8   received samples in accordance with a hypothesized channelization code
to provide decovered symbols;

10   a memory unit operative to store intermediate results representative of
the decovered symbols from the at least one demodulator element; and

12   a processor operative to receive and process the intermediate results in
accordance with an actual channelization code and the hypothesized
14   channelization code to generate final results.

      21. The receiver unit of claim 20, wherein each demodulator element
2   further includes

        a pilot processing unit operative to receive and process the
4   received samples to generate pilot estimates, and

        a data recovery element coupled to the pilot processor and the
6   data processing unit, the data recovery element operative to receive the
pilot estimates and the decovered symbols and generate the partially
8   processed symbols.

      22. The receiver unit of claim 21, wherein the data recovery element is
2   operative to receive and demodulate the decovered symbols with the pilot
estimates to generate the partially processed symbols.

      23. The receiver unit of claim 22, further comprising:
2   a combiner coupled to the at least one demodulator element and
operative to receive and combine partially processed symbols from one or more
4   assigned demodulator elements to generate the intermediate results.

      24. A receiver unit operative to process a physical channel in a CDMA
2   communications system, comprising:

      a receiver operative to receive a modulated signal and provide received
4   samples indicative of data transmitted on the physical channel;

      a plurality of demodulator elements coupled to the receiver, each
6   demodulator element operative to receive and demodulate the received
samples with a particular set of parameters to provide respective partially

28

8 processed symbols, wherein one of the parameters in the set corresponds to a
hypothesized channelization code used to decover the received samples; and

10 a combiner coupled to the plurality of demodulator elements and
operative to receive and combine the partially processed symbols from the

12 plurality of demodulator elements to generate intermediate results that are
stored in the memory unit.